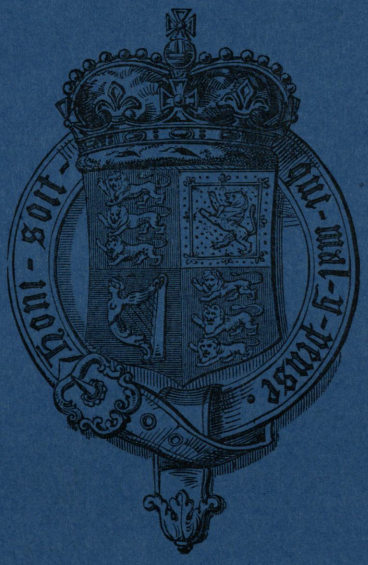
Class II.] [Price 6d.

OFFICIAL

Descriptive and Illustrated

CATALOGUE.

By Authority of the Royal Commissioners.



CLASS II.

CHEMICAL AND PHARMACEUTICAL PRODUCTS.

LONDON:
SPICER BROTHERS, WHOLESALE STATIONERS; W. CLOWES & SONS, PRINTERS;
CONTRACTORS TO THE ROYAL COMMISSION,
29 NEW BRIDGE STREET, BLACKFRIARS, AND AT THE
EXHIBITION BUILDING.
1851.

Class II.—ALPHABETICAL LIST OF EXHIBITORS.

[*The figures annexed to the Names refer to the Numbers prefixed to the Articles exhibited; those between parentheses to the pages of the Catalogue.*]

Austin, J. B., 114 (185)

Banhart, F., 49 (180)
Barnes, J. B., 45 (179)
Bass, J., 95 (184)
Bell, J., M.P., 115 (185)
Bell & Co., 66 (181)
Blundell, Spence, & Co., 48 (179)
Bower, J., 42 (179)
Bramwell, T., 27 (178)
Brearey, W. A., 80 (182)
Brown, F., 57 (180)
Buckley, J., 4 (174)
Bullock, E., & Co., 37 (178)
Bullock, J. L., 34 (178)
Burt, S. J., 85 (183)
Button, C., 3 (174)

Cheshire, J., jun., 30 (178)
Clifford, G., 26 (177)
Collins, R. N., 109 (185)
Cook, T. A., 15 (176)
Coppock, J., 65 (181)
Coulson, Jukes, & Co., 72 (182)

Davies, J., 70 (182)
Davy, Mackmurdo, & Co., 62 (181)
Dauptain, Gorton, & Co., 63 (181)
Dentith, W., & Co., 8 (175)
Devenport, J. T., 111 (185)
Dickson, G., & Co., 79 (182)
Dinneford & Co., 51 (180)
Duncan, W. L., 76 (182)
Duncan, Flockhart, & Co., 104 (184)

Ellam, Jones, & Co., 58 (180)
Estcourt, S., 64 (181)
Evans, F. J., 5 (174)

Fawcett, B., 29 (178)
Fowler, J., 55 (180)
Fox & Barrington, 44 (179)

Godfrey & Cooke, 92 (183)
Godson, S. H., 50 (180)

Hahnel & Ellis, 10 (175)
Hall, J., 40 (178)
Hattersley, W., 110 (185)
Hawthorne, —, 39 (178)
Hemingway, A. W., 24 (177)
Hills, F. C., 23 (177)
Hopkin & Williams, 41 (178)
Hopwood, H., 100 (184)
Howards & Kent, 11 (175)
Humfrey, C., 78 (182)
Hurlet Campsie Company, 13 (176)
Huskisson, J., W., & H., 86 (183)

Jenkins, W. H., 43 (179)
Jennings, H. C., 99 (184)
Johnson, J. R., 60 (181)

Kane, W. J., 53 (180)
Keating, T., 102 (184)
Kent, J. H., 90 (183)
King, W. W., 84 (183)
Kurtz & Schmersahl, 9 (175)

Lamplough, H., 71 (182)
Lawrence, W., 56 (180)
Lea, A., 105 (184)
Lee, C., 69 (182)
Leifchild, J., 67 (181)
Lindsay, G., 16 (176)
Linklater, J., 82 (183)
London Druggists, the, 117 (185)

McCulloch, C., 96 (184)
Macfarlan, J. F., & Co., 107 (184)
Marshall, J., 68 (181)
Mason, C., & Son, 22 (177)
Mason, Mrs. B., 77 (182)
May & Baker, 14 (176)
Melincrythan Chemical Company, 2 (174)
Moberly, W., 17 (177)
Morson, T. N. R., & Son, 106 (184)
Murray, Sir J., M.D., 87 (183)

Naylor, W., 35 (178)
Nissen, H., & Parker, G., 36 (178)
Nixey, W. G., 112 (185)

Owen, C., 83 (183)
Oyler S., 113 (185)

Parrott, W., 46 (179)
Pattinson, W. W., 18 (177)
Peacock, G., 73 (182)
Picciotto, M. H., 33 (178)
Pontifex & Wood, 1 (174)
Ponting, T. C., 25 (177)
Pound, M., 108 (184)

Richardson Brothers & Co., 19 (177)
Robertson, W., 81 (182)
Russell & Robertson, 59 (180)

Savory & Moore, 116 (185)
Schilling & Sutton, 52 (180)
Scott, L., 61 (181)
Smith, T. & H., 94 (183)
Spence, P., 7 (174)
Spencer, J. A., 31 (178)
Spurgin, T., 38 (178)
Squire, P., 93 (183)
Stevenson, W., 20 (177)
Stephens, H., 74 (182)
Struve & Co., 52A (180)
Sturges, J., 88 (183)

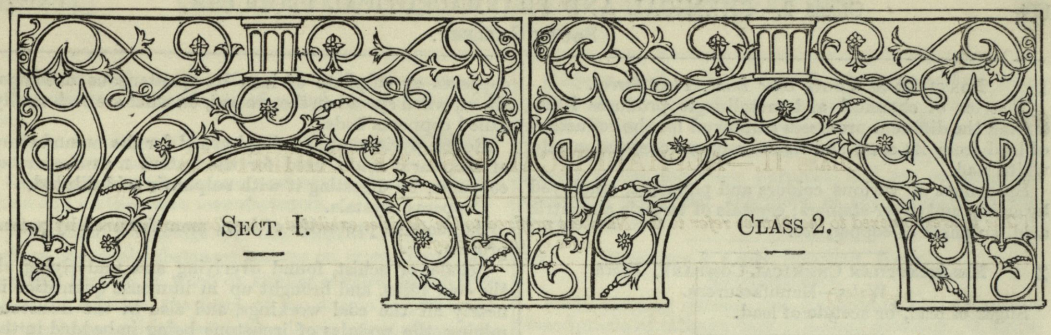
Tennant, M. B., 101 (184)
Tennants, Clow, & Co., 7A (174)
Truman, Hanbury, & Buxton, 91 (183)
Tulloh, A., 21 (177)
Tustian, J., 97 (184)
Tustian & Usher, 98 (184)

Ward, J., 89 (183)
Ward, Smith, & Co., 54 (180)
Washington Chemical Company, 12 (176)
Watt, W., 32 (178)
Watts, J., 103 (184)
Wilson, J., 6 (174)
Winsor & Newton, 28 (178)
Wood & Bedford, 47 (179)

Young, J., 7B (174)

It is hoped that all the errors which have been pointed out in the first issue of the Catalogue have been corrected; and it is particularly requested that any inaccuracies or deficiencies still existing may be communicated to the Catalogue Office at the Exhibition Building without delay, with a memorandum of the Class and Number where they occur.

Alphabetical Indexes are in course of preparation, and will be published shortly.



CHEMICAL AND PHARMACEUTICAL PRODUCTS.

INTRODUCTION.

THE results of the science directly illustrated by this Class will probably be more generally appreciated than the means by which such results are attained. But these are not to be sought among the chemical and pharmaceutical products, any more than are the beautiful mechanisms of other classes to be found in association with the raw mineral which supplied the material for their formation.

CLASS 2 is principally contained in the SOUTH GALLERY, and is most conveniently reached by ascending the stair near the south entrance at the transept. The objects in the Class are immediately encountered on gaining the Gallery. The Class is divisible into the following heads :—A. Chemical substances used in manufacture. B. Rarer chemical substances for the scientific chemist; and C. Chemical substances used in medicine.

The objects in this Class do not admit of more than a general grouping, into the chemicals of the chemical factories, and the more delicate and refined compounds produced in the laboratory. The former of these, inclusive of large specimens of alum, protosulphate of iron (copperas), and soda are interesting as representing a department of British commerce which has grown into importance within a very recent period. The manufacture, especially of caustic and carbonate of soda on the great scale, has originated and developed itself in a degree almost unparalleled in the history of commerce within twenty or thirty years of the present time. The fires of the kelp burners on the shores of the islands of Scotland are scarcely now extinct, when vast factories, employing large numbers of individuals appear to produce in enormous quantities the same alkali, which was until recently scantily derived from the fused ashes of marine plants. The manufacture of this alkali, by an ingenious decomposition of common salt by the simple aid of sulphuric acid, chalk, sawdust, and coal, is now prosecuted to a vast extent for the supply of the industrial arts generally, the quantity used in medicine and pharmacy being comparatively insignificant. At some alkali works fifty and sixty tons and upwards of common salt are decomposed every week, and converted into caustic or carbonate of soda. The alum factories are not less extensive. At those establishments crystallizations on a scale emulating those of nature are constantly in progress. Some very large specimens of these crystals, and of those of other chemical compounds are placed in the CENTRAL AVENUE, some of the masses being 8 feet in height. The manufacture of sulphuric acid, and of the compounds used by the dyer and calico-printer, also occupies a prominent feature of commercial enterprise. The prussiates of potash forming large masses of yellow and red crystals, and the green, but perishable crystals of copperas, are illustrations of substances largely used in the arts, and the colours and dyes produced by their assistance, present themselves in every direction, when the classes relating to textile printed fabrics are examined.

The chemical works of this country are principally situated at Liverpool, at Newcastle-upon-Tyne, and at Glasgow. The area of ground occupied by some of them equals that covered by the Exhibition Building, and in the various departments as many as five or six steam-engines are employed. The chimneys of these works are in one or two instances 500 feet in height, and the workmen employed form a little population resident in the immediate vicinity of the works.

The application of scientific chemistry to the purposes of medicine is scarcely less recent than the commercial development of chemical manufacture. Medicinal substances appeared for a period to have been overlooked by the chemist, and little attention was given to their preparation. This cannot now be said. The specimens of vegeto-alkaloids, the minerals used in pharmacy and of their compounds—of beautiful crystalline forms, indicate the progress made in the application of philosophic chemistry to the production of pharmaceutical preparations. A variety of compounds obtained by delicate chemical reactions, and from substances requiring great carefulness in manipulation, are also included in this Class.

The whole Class, though not an extensive one, represents the growing attention of men of eminence to chemistry as a manufacture ; and of men of science to the application of chemical philosophy to the processes carried on on the smaller scale in the laboratory. The same facilities which exist in this country for the prosecution of other departments of commercial and industrial enterprise have carried chemical manufactures to their present important and commanding position. The direct dependence of many of the arts upon the existence of and the accuracy of production in these chemical works cannot now be questioned.—R. E.

1 PONTIFEX & WOOD, *Shoe Lane, Fleet Street.*

A series of chemical and metallurgic products illustrating the different processes employed for the reduction of lead from its ores, and its subsequent conversion into white lead.

Specimens of various colours and pigments, employed by artists and paper-stainers; crystals of tartaric and citric acid, sulphate of copper, &c.

2 MELINCRYTHAN CHEMICAL COMPANY, *Neath, Wales*—Manufacturers.

Sugar of lead, or acetate of lead.

3 BUTTON, CHARLES, 146 *Holborn Bars*—Manufacturer.

Chemical products:—Acids—boracic, chromic, carbazotic, gallic, pyrogallic, metagallic, phosphoric and glacial anhydrous, and uric.

Alum—pure ammonia—chrome—potash—and soda alums.

Ammonia nitrate, benzoate, and oxalate; and binoxalate (impure), remarkable for the size of the crystals.

Arsenic iodide; barium chloride—oxide, and oxide hydrate; barytes nitrate; bismuth chromate and nitrate; cadmium chromate; calcium phosphuret; cerium oxide and oxalate; cobalt acetate, nitrate, phosphate, and chloride; copper protoxide and suboxide; glucina iron sulphuret; lead nitrate, pure; lead chromate, fused; manganese sulphate; mercury nitrate, bichromate, and bicyanide; nickel sulphate; phosphate of soda and ammonia; potash, pure; potash chromate, silicate, and binarseniate; potassium iodide, bromide, and fluoride; silver nitrate; soda, pure; soda, nitrate; strontia nitrate; tin bisulphuret; tungstic acid; tungstate of soda; bitungstate of ammonia; uranium nitrate and oxide; zinc chloride and sulphate, pure; phosphorus; iodine, pure; and bromine, pure.

Soluble Prussian blue. Iodide of potassium free from alkaline reaction; exhibited by Rev. J. B. Reade, Stone Vicarage, Aylesbury.

4 BUCKLEY, J., the Trustees of the late, *Manchester*—Manufacturers.

Crystal of copperas, or sulphate of iron.

[This substance is in reality an impure sulphate of iron. The copperas of commerce is obtained by exposing heaps of bisulphuret of iron, or iron pyrites, to moisture and air for a considerable period. The elementary constituents of the iron pyrites, sulphur and iron, are oxidized, and a sulphate of the protoxide of iron is obtained, which is washed out and crystallized. It is largely used in the arts for dyeing, ink-making, and also in chemistry and medicine.—R. E.]

5 EVANS, F. J.

Naphthaline, from coal.

6 WILSON, JOHN, *Glasgow*—Manufacturer.

Alum slate, raw, in the condition of bisulphuret of iron and alumina; found resting on the top of the coal in the mines. Three other specimens of the same slate, showing the progressive stages of decomposition.

Sample of the same slate calcined.

Tub of alum in the last stage of manufacture.

Crystals of alum.

Bisulphuret of iron (iron pyrites).

Iron pyrites decomposed.

Sulphate of iron (copperas) obtained from the same ore.

Sulphate of ammonia obtained from ammoniacal water, one of the products of the distillation of coal.

Naphthaline, obtained from naphtha; rare, in consequence of its size and purity.

7 SPENCE, PETER, *Pendleton Alum Works, Manchester*—Inventor and Manufacturer.

Iron pyrites.—Bisulphuret of iron, obtained in nodules interspersed in coal; its most general use is to furnish copperas or sulphate of iron by spontaneous decomposition, when spread on the ground, on what are technically called copperas beds.

Refuse pyrites, after being burned for the manufacture of sulphuric acid; used for the patent manufacture of copperas, by digesting it with sulphuric acid diluted.

Copperas crystals.

Sulphate of protoxide of iron, manufactured by patent process.

Schale, or schist, found overlying and underlying all the coal veins, and brought up in immense quantities in nearly all the coal workings, and also in the ironstone mining, the nodules of ironstone being imbedded in the shale. By a patent process, its own weight of alum can be produced, by acting on it with sulphuric acid, &c., one ton of shale, of average quality, yielding one ton of alum.

Shale, calcined for the manufacture of alum.

Shale in the process or manufacture of alum.

Alum of the first and second crystallization.

Alum finished for the market.

Patent zinc cement, or hydraulic mortar.

Specimens of the waste materials from which the cement is manufactured.

Bust composed of the cement.

The cement laid on to wall. Manufactured entirely from refuse matters.

The refuse shale, after the patent alum process, affords the silica and alumina; the refuse lime, after purifying gas for illumination, affords the calcareous ingredient; and the metallic constituent, zinc, is obtained as sulphate of zinc from the refuse of Wicklow pyrites, after its use in the manufacture of sulphuric acid. The cement is hydraulic; the affinity of oxide of zinc for oxygen prevents the oxidization of any iron, and its deleterious effect on vegetation prevents the growth of moss on its surface.

[Iron pyrites may be made to yield at least two valu able chemical products, sulphur, and sulphate of iron, or copperas. The first is obtained by heat, sulphate of iron by simply exposing the iron pyrites, which is a bisulphuret of iron, to the weather. The mass absorbs oxygen from the air, a sulphate of iron is formed, and is washed out and crystallized. The shale or schist employed in the alum manufacture is a slaty clay found both overlying and underlying coal strata, and containing much pyrites.—R. E.]

7A TENNANTS, CLOW, & Co., *Manchester*—Manufacturers.

Sulphate of copper. Sulphate of zinc. Muriate of tin in crystals. Bichloride of tin. Nitrate of lead. Bichromate of potash. Prussiate of potash. Prussiate (red). Chlorate of potash. Garancine. Stannate of soda. Bisulphate of potash. Soda-ash. Sal-ammoniac; and pink salt.

[The compounds here exhibited furnish a remarkable illustration of the extensive applications of chemistry to modern arts and manufactures. The series exhibited contains many compounds unknown to commerce a few years ago. They are all employed in various processes of either dyeing or calico-printing.—R. E.]

7B YOUNG, J., *Ardwick Bridge, Manchester*—Inventor.

Mineral oil. Paraffine. Stannates, with models of apparatus

[This mineral oil occurs as a natural spring in a coal-pit at Riddings, near Alfreton. It is used largely for machinery, the paraffine being very anti-frictional. Paraffine is one of the most remarkable of products, and has received its name from its not having chemical affinity for any substance whatever. It is a result of the distillation of tar-oils.—R. E.]

8 DENTITH, W., & Co., *Manchester*—Manufacturers.

Ornaments of bichromate of potash, and of nitrate of lead.

Chromate of potash, prussiate of potash, and Whitby alum, used by calico-printers and dyers.

Green oxide of chromium, and oxide of zinc, used by china and earthenware manufacturers.

[By taking advantage of the elegant forms which various chemical substances assume on crystallizing, and inserting baskets of wire, or similar articles, into a crystallizable solution, the form of the article is preserved, but the character is altered by the development of exquisite crystals, which give the objects a peculiar and remarkable appearance.—R. E.]

9 KURTZ & SCHMERSAHL, *Cornbrook Works, Manchester*—Manufacturers.

New colouring matters, and preparations for printing and dyeing in cotton, linen, silk, and wool.

Specimens of printing and dyeing by means of the preparations.

Ultramarine, in different qualities.

[Lapis lazuli is usually found in granite and crystalline limestone. The finely-coloured varieties are employed for vases, in mosaics and furniture, and are much prized. The pigment ultramarine is prepared from the mineral, by slightly igniting it, shaking the mass in water, and after reducing it to fine powder, mixing it with a resinous paste. This paste is then kneaded in cold water, which washes out the ultramarine, the impurities being retained by the paste. From the costliness of ultramarine its use was formerly confined to the artist; since, however, the discovery by M. Grumet (guided by the analysis of the pigment by MM. Clement and Desormes) of a method of preparing it artificially, its price has become gradually so much reduced as to admit of its very general employment in the arts. For, although M. Grumet kept his process a secret, M. Gmelin and other chemists have published prescriptions for its production, and its manufacture has been of late years much extended, particularly in Germany, though only very recently introduced into England. Ultramarine is a very permanent colour under atmospheric influences, but is decolorized by the presence of acids with liberation of hydro-sulphuric acid, hence, in its employment, the presence of acids should be avoided. Artificial ultramarine may be prepared, according to C. Gmelin, by rapidly igniting a mixture of equal parts of silica, carbonate of soda, and sulphur, first adding a sufficient quantity of a solution of soda to dissolve the silica. The result is a bluish-green mass, which, by ignition in contact with air, becomes blue. Ultramarine consists essentially of silica, alumina, soda, and sulphur; a small quantity of iron appears to be beneficial, but an excess impairs the beauty of the colour.—W. D. L. R.]

10 HAHNEL & ELLIS, 9 *Sugar Lane, Manchester*—Manufacturers.

Copper and its compounds—Copper ore from the Burra-Burra mine, Australia; sheet, oxide, and sulphate of copper.

Lead and its compounds—Lead ore; protoxide of lead; nitrate of lead.

Tin and its compounds—Tin ore from Cornwall; tin granulated; tin salts, or protochloride of tin; sulphate of soda, or salt cake.

Sulphur—Rough sulphur from Sicily; roll, flowers, crystallized, lac, and black sulphur.

Archill—Orchella weed from Angola; red archill; blue archill; cudbear.

Ammonia—Muriate and sulphate of ammonia.

[Copper, lead, and tin furnish highly important compounds for the use of the dyer and calico-printer. Sulphate of copper, or blue vitriol, nitrate and acetate of lead, and protochloride of tin are the compounds most largely in use for these purposes, and are consumed in quantities altogether enormous in the Lancashire printworks.—R. E.]

11 HOWARDS & KENT, *Stratford, Essex*—Manufacturers.

Barks yielding quinine and cinchonine, viz. 1, various descriptions of calisaya bark (*Cinchona calisaya*). 2, Carabaya bark (*Cinchona ovata*). 3, Cusco bark (*Cinchona pubescens*). 4, Carthagena bark (*Cinchona cordifolia*). 5—8, Specimens of red, crown, grey, and loxa barks. 9, Various descriptions of barks used for adulteration. 10, Cinchona Australis. 11, Cascarilla macrocarpa. 12, Cascarilla corua. 13, Cascarilla magnifolia. 14, Buena hexandra. 15, Exostema Peruviana or tacumez bark. 16, Laplacea quinoderma.

Salts of quinine and cinchonine:—Disulphate, sulphate, citrate, hydrochlorate, phosphate, and tartrate.

Nectandra Rodiœi, or green-heart bark, and its alkaloid bebeerine.

[The tree from which the green-heart bark is obtained belongs to the natural order *Lauraceœ*, a family of plants yielding many powerful and valued medicinal agents. *Nectandra Rodiœi* has been shown by Dr. Maclagan to contain an important alkaloid, called from the native name of the tree (*Bebeeru*) *Bebeerine*, or *Biberine*. Its effects are comparable to those of quinine. The tree flourishes in Demerara, and its wood is extremely hard.—R. E.]

Refined camphor, with different kinds of rough camphor, &c.:—1, Japan or Dutch camphor. 2, China or Formosa camphor. 3, Borneo or native camphor. 4, Refined camphor. 5, Camphor in the glass in which it was sublimed.

[The tree which yields camphor is *Laurus camphora*. Japan camphor is considered the best, and is imported in tubs into the United Kingdom, but not in large quantities. Crude camphor from China is principally obtained from the island of Formosa, whence its commercial designation. Crude camphor is obtained from the trees yielding it by chopping up the branches and boiling them in water, when the camphor is separated either by cooling or sublimation. It is refined in this country by being re-sublimed.—R. E.]

Refined borax, and articles from which it is made:—1, Commercial boracic acid. 2, Purified boracic acid. 3, Tincal, or natural borax. 4, Artificial tincal. 5, East India refined borax. 6, English refined borax. 7, Modified crystals. 8, Octohedral borax.

[The origin of boracic acid is extremely interesting. Its principal sources are the celebrated lagoons of Tuscany, where it is obtained by a singularly simple and ingenious process. It rises with steam from the heated earth in a region where volcanic tumult is conspicuously manifest, and was formerly avoided by the superstitious peasantry in its vicinity. This steam is condensed by being passed into basins partly filled with water; the boracic acid is held in solution, purified, evaporated, and crystallized. From 10,000 to 12,000 lbs. of this acid are thus obtained every day. Boracic acid is chiefly employed as a source of borax.

Borax consists chemically, when pure, of a biborate of soda. It is, in its impure state, the tincal of commerce, and is obtained in large quanties from a lake in Thibet, on the edges of which it crystallizes, and is collected by the natives. It is also procured from lakes in China and Persia. The greater part of the borax of commerce is obtained from the saturation of boracic acid with soda.

Borax is greatly used in the arts as a flux, and for glazing porcelain; also in medicine, and pyrotechny for making "green fire."—R. E.]

Tartaric acid, with specimens of the argols and tartars from which it is made:—1, Argols, various kinds. 2, Tartars, various kinds. 3, Crystallized tartaric acid. 4, The same, in the first stage of manufacture. 5, Powdered tartaric acid.

Citric acid and the articles from which it is made:—1, Concentrated lemon juice. 2, Citrate of lime. 3, Crystallized citric acid. 4, Citric acid, in the first stage of manufacture.

Antimony and preparations:—1, Antimony. 2, Black sulphuret of antimony. 3, Oxysulphuret of antimony. 4, Emetic tartar. 5, Antimonial powder. 6, Kermes mineral.

Silver and preparations:—1, Silver. 2, Lunar caustic. 3, Crystallized nitrate of silver.

[*Nitrate of silver*, commonly called *Lunar caustic*, is a preparation obtained by the solution of metallic silver in nitric acid. Chemical union takes place, and the solution being evaporated and crystallized, a solid nitrate is obtained. This is, for medical purposes, fused and run into moulds. This compound of silver, in a pure state, is of special value as a re-agent to the chemist; it is also extremely useful in the hands of the physician and surgeon. Very pure crystallized nitrate of silver is employed for the production of photographic pictures on paper, glass, and porcelain. When deposited on these surfaces, under peculiar circumstances, it is highly sensitive to the light.—R. E.]

Bismuth and preparations:—1, Bismuth. 2, Oxide of bismuth. 3, Pearl white.

Iron and preparations:—1, Iron. 2, Ammonio chloride of iron. 3, Tartrate of iron. 4, Oxide of iron. 5, Green vitriol. 6, Ammonio citrate of iron. 7, Ammonio tartrate of iron. 8, Citrate of iron and quinine.

Mercury and preparations:—1, Mercury. 2, Oxide of mercury. 3, Binoxide of mercury. 4, Red precipitate. 5, White precipitate. 6, Crude calomel. 7, Crystallized calomel. 8, Calomel. 9, Hydro-calomel, sublimed under water. 10, Corrosive sublimate. 11, Sub-sulphate of mercury.

Magnesia and preparations:—1, Magnesian shale. 2, Magnesian limestone. 3, Epsom salts. 4, Carbonate of magnesia. 5, Calcined magnesia.

[The well-known substance called Epsom Salts is an important preparation of magnesia. It is, in some instances, procured by an ingenious system of employing the residual hydrochloric acid of alkali works, which is made to act upon native magnesian limestone; the lime is dissolved out by the acid, and the residual matter, consisting chiefly of magnesia, is dissolved in sulphuric acid, purified and crystallized. In other cases it is largely obtained by simply acting upon magnesian limestone with dilute sulphuric acid; it is also obtained from the residual salts of sea-water, from which common salt has been separated.—R. E.]

Preparations of potassium:—1, Potashes. 2, Pearlashes. 3, Carbonate of potash. 4, Bicarbonate of potash. 5, Sulphate of potash. 6, Soluble tartar. 7, Commercial saltpetre. 8, Purified nitre.

[The difference in the chemical composition of the potashes and pearlashes of commerce, is, that the one is chiefly a caustic form of the alkali, and the other contains more of the carbonate. Both are alike derived from the combustion of wood. America is the chief source of this alkali at present. Her immense primeval forests, upon which the efforts of man make but little impression, present an inexhaustible source of this valuable alkali. The wood is piled up in a pyramidal heap, and the ashes are collected, partly purified, and fused. Pearlash is prepared from the "black salts," or impure caustic and carbonated alkali, by fusion in an open furnace. Potash is largely employed in medicine and the arts. About 100,000 cwt. are annually imported into Great Britain from America alone.—R. E.]

Preparations of sodium:—1. Soda ash. 2. Subcarbonate of soda. 3. Subcarbonate of soda, absolutely pure. 4. Sesquicarbonate of soda. 5. Bicarbonate of soda. 6. Rochelle salt in the first stage of manufacture. 7. Pure Rochelle salt. 8. Rochelle salt, powdered. 9. Phosphate of soda. 10. Cubic nitre. 11. Purified nitrate of soda. 12. Glauber salts. 13. Hyposulphite of soda.

[The last-named preparation of soda—hyposulphite of soda—is a substance of great importance and peculiar interest to the photographer. It is readily soluble in water, and the solution dissolves, with great facility, the compounds of silver. After a Daguerreotype picture has been taken and developed by mercurial vapour, the coating of iodide and bromide of silver formed on the surface of the plate is instantly dissolved by washing it with this solution. The picture is afterwards dried and gilded. In the Talbotype, hyposulphite of soda is employed to remove the sensitive coating of silver, and thus fix the impressions so as to render them insensible to the further influence of light.—R. E.]

Zinc and its preparations:—1, Zinc. 2, Oxide of zinc. 3, Acetate of zinc. 4, White vitriol.

Iodine and its preparations:—1, Seaweed, yielding iodine. 2, Kelp. 3, Commercial iodine. 4, Resublimed iodine. 5, Hydriodate of potash. 6, Biniodide of mercury.

Opium and its preparations:—1, Opium. 2, Morphia. 3, Acetate of morphia. 4, Muriate of morphia.

[Morphia is a powerful alkaloid, being the active principle of opium. The acetate and muriate are its most common preparations for pharmaceutical purposes.—R. E.]

12 WASHINGTON CHEMICAL COMPANY, *Washington, Newcastle.*

13 HURLET CAMPSIE COMPANY, *Glasgow.*
Alum. Red and yellow prussiates of potash.

14 MAY & BAKER, *Battersea, Surrey*—Manufacturers.
Specimens of nitric acid. Crystals of nitrate of silver. Trinitrate of bismuth. Rough camphor, as imported. Refined camphor in refining glass; camphor, prepared for sale. Precipitated chalk. White precipitate of mercury, Corrosive sublimate. Crude calomel. Prepared calomel. Red precipitate of mercury. Turpith mineral. Ponderous magnesia. Acetate of potash; acetate of zinc. Oxide of zinc. Sulphate of zinc, and chlorate of potash.

[*Nitric acid.*—The aquafortis of commerce consists of impure nitric acid. It is obtained from the distillation of concentrated sulphuric acid mixed with nitrate of potash or soda. The commercial substance called Chilian, or Peruvian saltpetre, is nitrate of soda, and has largely been used lately in the preparation of this acid. This acid is of immense importance in the arts, chemistry, and medicine.—R. E.]

15 COOK, THOMAS AINSLEY, *Newcastle-upon-Tyne*—Manufacturer.
Crystallized carbonate of soda. Manufactured by the Walker Alkali Company.

16 LINDSAY, G., *Sunderland*—Manufacturer.
Green vitriol, or copperas of commerce, a protosulphate of iron, extensively used in dyeing silks, woollens, and cottons, making writing inks, Venetian red, &c. It is

manufactured from iron pyrites, procured from the coal mines, exposed to air and moisture; the excess of acid being saturated by digesting the lixivium with iron plates and turnings.

[By heating proto-sulphate of iron to redness, it is decomposed, sulphurous and sulphuric acids being evolved, and sesquioxide of iron (Venetian red, colcothar, jeweller's rouge) remaining.—W. D. L. R.]

17 MOBERLY, W., *Mulgrave Alum Works, Sandsend, near Whitby*—Producer and Manufacturer.

Raw alum shale, as cut from the cliff, showing embedded nodules of cement stone; the same after calcination. Alum meal, or alum as first crystallized. Half a cask of finished alum.

Rough sulphate of magnesia, being the residuum obtained in the manufacture of alum, used for making refined Epsom salts. Refined sulphate of magnesia, or Epsom salts, purified by a new patent process.

Patent double salt of ammonia and magnesia, for a manure for top dressing.

Bones dissolved in sulphate of magnesia, for a manure.

[Alum is manufactured at Whitby, by the combustion of the schists of the upper lias, which contain a certain quantity of iron pyrites and bituminous, or carbonaceous matter. The temperature being properly regulated, and water occasionally supplied, a double decomposition takes place, producing sulphate of alumina and sulphate of iron, together with a portion of sulphate of magnesia, if any magnesia is present in the alum schist. A subsequent separation of the ingredients takes place. A certain quantity of the sulphate or muriate of potash is added, and the alum is crystallized. Alum is a triple salt consisting of a hydrated sulphate of alumina and potash, soda, or ammonia; but a portion of the alumina is occasionally replaced by iron.—D. T. A.]

18 PATTINSON, WILLIAM WATSON, *Gateshead, Newcastle-upon-Tyne*—Manufacturer.

Large mass of crystallized alum, or sulphate of alumina and potash. Masses of pure sulphate of alumina, called in commerce concentrated alum. Specimen of bicarbonate of soda.—Manufactured at the Felling Chemical works.

[The alum of English commerce is obtained in large quantities from manufactories at Whitby, in Yorkshire. A horizontal bed of fuel, composed of brushwood or of small coal, is first made, and upon it pieces of aluminous rock are piled. The fuel being kindled, the whole mass slowly ignites. More rock is piled upon it, until, in some instances, a vast heap of inflamed material, 100 feet high and 200 feet square, is raised, and continues to burn for months. The aluminous schist being thus disintegrated, and its chemical constitution changed, is lixiviated, the solution evaporated in large cisterns and purified, and sulphate of potash or ammonia is then added. The alum thus formed is dissolved, and crystallized by pouring the solution into casks made with movable staves, called "rocheing casks." On removing the staves, an apparently solid barrel of alum is exposed. This is pierced with an instrument near the bottom, when the uncrystallized solution runs out. The mass, broken into lumps and dried, is the alum of commerce. The shipments of alum from Whitby in 1841 amounted to 3,237 tons. Alum is employed in medicine, in chemistry, and in the arts. Its most important use is as a mordant for dyers.—R. E.]

19 RICHARDSON BROTHERS & Co.—Manufacturers.

Specimens of refined saltpetre or nitrate of potash, obtained chiefly from the East Indies, and shipped from Calcutta. This substance is used in the manufacture of gunpowder, oil of vitriol, aqua fortis, and other chemical products, and also in curing provisions.

[Saltpetre is distinguished as the special natural product of the surface soil of warm countries. India, Egypt, Persia, Spain, and Italy, yield our chief supply. It is obtained from the soil, on the surface of which it makes its appearance like hoar, by lixiviation. The solution is then filtered, evaporated, and crystallized. It is principally imported into Great Britain from Calcutta and Madras. The amount imported from the East Indies and Ceylon in 1841, was 261,552 cwts. Its uses in chemistry, medicine, and the arts are familiar.—R. E.]

20 STEVENSON, WILLIAM, *Jarrow Chemical Works, South Shields*—Manufacturer.

Crystals of soda converted into bicarbonate of soda by exposure to carbonic acid gas.

21 TULLOH, A., *Waltham Abbey*—Producer.

Saltpetre, charcoal, and sulphur, used in the manufacture of gunpowder at the Royal Gunpowder Mills at Waltham Abbey.

22 MASON, CHARLES, & SON, 11 *Munster Street, Regent's Park*—Manufacturers.

Royal premier blacking. French and waterproof varnish.

23 HILLS, F. C., *Deptford*—Patentee and Manufacturer.

Nitrate of potash (saltpetre), made by the decomposition of muriate of potash (chloride of potassium) by nitrate of soda, a patent process; the muriate of potash being obtained from sea-weed or kelp.

Dome of sal ammoniac, sublimed from rough muriate of ammonia, made from the ammoniacal liquid produced at gas works, by the addition of muriatic acid.

Cake of sesquicarbonate of ammonia, or common smelling salts, sublimed from rough sesquicarbonate of ammonia, made by the decomposition of sulphate of ammonia by carbonate of lime; the ammonia being produced at gas-works.

[Nitrate of soda has lately assumed high commercial importance from its value to the chemical manufacturer, and to the agriculturist as a manure for wheat. It is found in immense quantities in South Peru, being obtained by lixiviation of the saline deposit in the soil, and is then evaporated and crystallized, dried and packed in bags, and conveyed to the coast by mules. In 1841, the imports of this article from Iquique amounted to 173,884 quintals.

The term "kelp" is applied to the fused ashes of several species of sea-weeds. The plants are collected, dried, and burnt, and the ashes form a melted mass, consisting of sulphates, carbonates, and chlorides of potash and soda, together with carbonate and sulphate of lime, alumina, and silica.—R. E.]

24 HEMINGWAY, A. W., *Portman Street.*

Double salts of iron.

25 PONTING, THOMAS CADBY, 32 *High Street, Bristol*—Inventor and Manufacturer.

Marking ink and illustrative specimen; for writing and drawing on linen, silk, and cotton, without preparation. Shaving cream. Medicinal vegetable fluid extracts, made with cold water.

26 CLIFFORD, G., 5 *Inner Temple Lane*—Producer.

Specimens of deeds, writings, books, maps, engravings, &c., injured by fire, water, age, dirt, smoke, &c., in a restored and unrestored state. Those with red lines round them were taken from the ruins of the great fire at Lincoln's Inn, January 14, 1849.

27 BRAMWELL, THOMAS, *Heworth Chemical Works, Newcastle-upon-Tyne*—Manufacturer.

Crystals of prussiate of potass of commerce.

Ferrocyanide of potassium of chemists, used for dyeing blue in place of indigo.

[*Ferrocyanide of potassium* is one of the most important chemical products to the dyer and calico-printer. It is obtained on the large scale by fusing animal matter with carbonate of potash and iron filings; cyanide, and subsequently ferrocyanide of potassium, are produced. Its compound formed on the addition of a salt of iron to ferrocyanide of potassium is of the most beautiful blue colour, and is called Prussian blue.—R. E.]

28 WINSOR & NEWTON, 38 *Rathbone Place, and North London Colour Works, Kentish Town*—Manufacturers.

Artists' pigments, in the raw and manufactured states, and in the various forms of preparation, for use in water-colour and oil painting, and in decorative art; including manufactures and preparations of the madder colours, cochineal, lapis lazuli, uranium, cadmium, chromium, and all the rarer kinds of chemical pigments.

Sable, badger, hog hair, and other brushes and pencils employed in drawing and painting.

Preparations of canvas, panels, millboard, apparatus, and boxes fitted for the use of artists. Palettes, and various other implements and materials employed in the fine and decorative arts.

Oxide of zinc.

[Several of the rarer metals yield oxides, which form brilliant pigments. Some of these are useful in enamel painting, in consequence of their not undergoing alteration by the heat employed in that art. Oxide of zinc has lately been much employed as a substitute for white lead.—R. E.]

29 FAWCETT, BENJAMIN, *late of* 73 *Snow Hill, and* 7 *Sumner Street, Southwark.*

Plain and ornamental specimens in graining or flatting, produced by a kind of paint free from noxious effluvia, and adapted for purposes to which white lead may be applied.

30 CHESHIRE, JOHN, jun., *Northwich*—Manufacturer.

A pyramid of best table salt, with several other specimens of salt. The salt springs in Cheshire are the greatest in Europe, and their annual production is upwards of 800,000 tons of salt.

31 SPENCER, JOHN ALEXANDER, 9 *Westbourne Place, Hyde Park*—Manufacturer.

Case, containing chemical preparations:—Naphthaline (from coal-tar); sulphate of magnesia (Epsom salts); benzoic acid (prepared by sublimation); caffeine (prepared from coffee); hydriodate of quinine; samples of cod-liver oil, 1849-50.

32 WATT, WILLIAM, *Dunchattan Chemical Works, Glasgow*—Manufacturer.

1. Sea-weed, collected dry on the sea-shore; which is burned and converted into
2. Kelp; which, on lixiviation, is crystallized for
3. Sulphate of potash; and
4. Chloride of potassium; and
5. Carbonate of soda (crude).

The liquor is then decomposed by sulphuric acid, converting the iodides contained in the liquor into hydriodic acid; which, on oxidation and sublimation,

6. Iodine, is separated from it.

33 PICCIOTTO, MOSES HAIM, 8 *Crosby Square*—Inventor and Manufacturer.

Specimens of decolorized and purified gum arabic, obtained by a patent chemical process. When dissolved, it forms a clear mucilage, and may be used for pharmaceutical purposes, for confectionery, for dressing silks, lace, tulle, printing, &c.

Sample of the original gum arabic from which the specimens were prepared.

Specimen of ultra marine blue, for the first time manufactured in London by Hochstaetter's process.

Pure crystallized mannite, prepared in Italy, and used for medicinal purposes.

[Mannite is obtained from manna, the concrete juice of a species of ash (*Ornus Europæa*), by dissolving in hot alcohol and crystallizing. It is a peculiar variety of sugar.—R. E.]

34 BULLOCK, JOHN LLOYD, 22, *Conduit Street*—Manufacturer.

A series of chemical products derived from substances used as food or medicine.

35 NAYLOR, WILLIAM, 56 *James Street, Oxford Street*—Manufacturer.

Decorative copal varnish, made from Sierra Leone gum copal. White hard varnish, made of picked gum sanderach; and mastic varnish, made of picked gum mastic.

New glass ventilators, opened and shut by the means of a rack and pulley, as a sun-blind.

Specimens of deal wood, stained to imitate different woods, without sizing; calculated to endure exposure, and admit of polish or varnish. The novelty claimed is the production of the stain without sizing.

36 NISSEN, HILARY, & PARKER, GEORGE, 43 *Mark Lane*—Inventors.

Specimens of tinted paper, chemically prepared in the pulp, for printing bank cheques upon. The chemical preparation renders any extraction of the writing by acids or alkalis immediately apparent.

37 BULLOCK, EDWARD, & Co., *Galway, Ireland.*

Arran kelp, muriate, nitrate, chlorate, and sulphate of potash.

Sulphate of soda, pure sulphur, commercial iodine, pure sublimed iodine, iodide of potash, iodide of lead, biniodide of mercury.

Preparations from sea-weed.

38 SPURGIN, T., *Saffron Walden*—Producer.

Root, stem, flower, and stigmata of saffron.

39 HAWTHORNE, —.

Stained woods.

40 HALL, JOSIAH, *Queenborough*—Producer.

Specimen of copperas, from the works at Queenborough, in the Isle of Sheppey, with specimens of pyrites and of copperas in a granulated form. It is used in dyeing and in the composition of colours, and, in its new and granulated form, may be used for purifying gas. The pyrites are found on the shore of the north-east side of the Isle of Sheppey; about eight tons are produced weekly. The granulated form is claimed as the peculiar merit of the specimen; it is effected by a refrigerator, and is used for dry mixing.

River copperas has hitherto been objected to as being crystallized in a soft and imperfect manner: the present specimen is freed from such defects by a strict attention to the copperas bed.

[Copperas is chemically an impure protosulphate of iron, and is obtained commercially by the decomposition of iron pyrites, or bisulphuret of iron, by atmospheric oxygen and water which is poured upon the beds.—R. E.]

41 HOPKIN & WILLIAMS, 5 *New Cavendish Street*—Manufacturers.

Pure tannin.
Crystallized chromic acid.
Benzoate of ammonia.
Biniodide of mercury.
Pure aconitine, used in neuralgic affections.
Valerianate of zinc, iron, quinine, bismuth, and of iron and quinine.

Cardole, said to be a new and powerful vesicating agent.
Bromoform, perbromide of formyle, a new anæsthetic agent said to be of greater power than chloroform.
Dutch liquid, chloride of olefiant gas, a new anæsthetic agent, said to be less irritating than chloroform.
Iodoform, periodide of formyle.
Pyrogallic acid, used in photography.
Cyanuret of potassium.
Citrate of iron and quinine.
Sulphate of iron and quinine, a new and powerful tonic.
Arseniate of soda, containing 15 atoms of water.
Kreatine, from the juice of the flesh.
Iodide of iron and quinine.

[Tannin (tannic acid) is obtained from nut-galls, and exists in the bark of all the oak tribe. It is the active agent of the barks used in the art of tanning, forming insoluble compounds with the components of the skins of animals (leather), which it preserves from putrefaction.

Chromic acid is a compound of the metal chromium and oxygen of a fine red colour: it parts readily with half its oxygen, and hence is a powerful oxidizing and bleaching agent. The salts of chromic acid are termed chromates, they are chiefly of a yellow colour; the chromates of Basyta, strontia, and lead are beautiful yellow pigments, much used in distemper and oil painting and printing.

Aconitine is a poisonous vegetable alkaloid, obtained from aconite (wolfstane, monkshood); it is used as a remedy in neuralgia.

Valerianic-acid (valeric acid), is a volatile acid belonging to the same class as acetic acid: it is obtained by oxidizing hydrated oxide of amyle (oil of potato spirit), as acetic acid (vinegar), is obtained by oxidizing hydrated ozide of ethyte (alcohol). It exists ready formed in the aromatic root of the *valeriana officinalis*, from which it is obtained by distillation with water. Valerianates (valerate), are compounds of valerianic acid with bases. Used as a nervous stimulant.

Formyle is a compound of carbon and hydrogen: it bears the same relation to wood spirit (hydrated oxide of methyle), as acetyle does to ordinary alcohol (hydrated oxide of ethyle): it is the radical of formic acid, as acetyle is of acetic acid. Its compounds with iodine and bromine are iodoform and bromoform.

Dutch liquid (oil of the Dutch chemists, olefiant gas), is the hydrochlorate of chloride of acetyle: it is obtained by mixing equal volumes of moist chlorine gas and olefiant gas.—W. D. L. R.]

[Pyrogallic acid is obtained by heating the dried extract of gallnuts, when it is collected by sublimation. In photography it is employed in extremely minute quantities. The pictures comes out without requiring to be developed by a second wash. But the action of this agent is so energetic that it is extremely difficult to manage. A solution of the proto-nitrate of iron possesses similar properties for the use of the photographer. —R. E.]

42 BOWER, J., *Hunslet, Leeds*—Manufacturer.
Carbonate of soda, containing 59 parts soda, and 41 carbonic acid, particularly adapted for scouring wool or woollens, as it removes grease without injuring the animal fibre.

43 JENKINS, WILLIAM HARRY, *Truro*—Inventor.
Arsenical powders—"Arsenical compound:" a general preventive of foulness, barnacles, &c., on ships' bottoms, buoys, &c., and of dry-rot in buildings.

44 FOX & BARRINGTON, 9 *Clarence Street, Manchester*—Manufacturers.
Common salt. Brimstone (sulphur). Salt cake (of soda). Barilla, or black ash (ball soda). Soda-ash (impure carbonate of soda). Bleaching-powder. Nitrate of lead. Chlorate of potash. Super-sulphate of soda. Tin crystals (chloride of tin). Blue or Roman vitriol (sulphate of copper). Nitrate of copper. Yellow prussiate (ferrocyanide of potassium). Red prussiate (ferricyanide of potassium). White, mottled, and yellow soda-soaps.

45 BARNES, JAMES BENJAMIN, 143 *New Bond Street*—Manufacturer.
Valerianic acid—produced from the hydrated oxide of amyle, or oil of corn spirit, by oxidation with chromic acid.

Valerianate of potassa and soda—employed in the formation of most of the following salts:—Valerianate of ammonia, baryta, strontia, lime, magnesia, alumina, oxide of chromium, protoxide of nickel and cobalt, and oxide of manganese.

Valerianate of oxide of iron, sesquioxide of iron, and oxide of zinc—employed in medicine as tonics and antispasmodics.

Valerianate of oxide of lead—oxide of silver—suboxide of mercury—oxide of mercury—teroxide of bismuth—oxide of copper—oxide of cadmium—teroxide of antimony—oxide of tin—morphia—quina—cinchonia—strychnia—and oxide of ethyle.

46 PARROTT, W., 7 *Cleveland Street*—Producer.
Illustrations in oil and water colour, of an intense and semi-transparent brown colouring substance, derived from the smut of corn.

47 WOOD & BEDFORD, *Leeds*—Manufacturers.
Specimens of the varieties of lichen used in the manufacture of cudbear, orchil and litmus, including *Roccella fuciformis, Roccella tinctoria, Ramalina farinacea, Parmelia perlata, Parmelia tartarea, Umbilicaria pustulata*, and *Gyrophora murmia*.

Substances obtained from the preceding, by chemical analysis, including erythric, lecanoric, and roccellic acids, picro-erythrine, orcine, and ashes of Roccella fuciformis. Specimens of cudbear and orchil, and of their applications in dyeing and staining.

[Chemists have shown the presence of a variety of singular chemical principles in lichens used by the dyer. The colouring principles are *Orcine, Erythrine, Vulpuline, Strychnochromine, Lecanorine, Usnine*, &c. The colouring matter is used largely by the dyer, and by the chemist for the preparation of test-papers.—R. E.]

48 BLUNDELL, SPENCE, & Co., *Hull, and 9 Upper Thames Street*—Inventors and Manufacturers.
Brunswick or Chrome Greens, of various tints and shades, used in oil painting and paper-staining.
Greens.—For painters, paper-stainers, &c., having a base of copper, viz., emerald green, green verditer, mineral greens, &c., &c.
Blues.—Chinese, Prussian, refiners, verditers, ultramarine, &c.
Ochres.—Yellow, red, brown, &c.
Yellows.—Chromes, all shades, King's yellow, patent yellow, Dutch pink, &c., &c.
Reds.—Red chrome, mineral and vegetable reds.
Lakes.—Carmines. Lakes of all colours and shades.
Browns.—Vandyke brown, umbers, terra de Sienna, York brown, &c.
Blacks.—Vegetable, animal, and mineral.
Whites.—Oxide of zinc, Cremnitz white, flake white, enamel white, satin white, Paris white, barytes (sulphate and carbonate), &c.
Leads.—Red, orange, grey, black, white (carbonate). White lead (oxi-chloride); a new invention, patented by H. L. Pattinson, Esq., of Newcastle-upon-Tyne.
Paints ground in oil, of every colour and variety of shade. Zinc white paint.—Unaffected by sulphurous gases, employed for a delicate dead white oil paint. Also a specimen of new drying oil, which assists its drying without impairing the delicacy of colour. Permanent and Paris green paints. Brunswick green paints.

Metallic red paint. Anti-corrosion, of all colours and shades. Stucco Paint.—An oil paint used with water; invented by the exhibitors. Patent dryer. Composition for ships' bottoms. Oils.—Linseed oil, raw, refined, and boiled. Rape oil.—Brown, refined for locomotive engines, and double refined for burning in lamps.

Varnishes for coachmakers.—Body, carriage, filling, black japan.

Varnishes for painters.—Oak, mahogany, black japan, furniture, japanners' gold size, quick-drying copal for furniture. Mastic or picture. White hard spirit. Paper varnish. Turpentine varnish.

Green varnish for Venetian blinds, &c.

Black varnish for ships and iron work.

French polish.

---

49 BANHART, F., *Swansea*—Producer.

Chemicals.

---

50 GODSON, SEPTIMUS H., *Tenbury, Worcestershire, and Rutland Gate, London*—Proprietor.

Samples of native mineral waters.

These mineral waters concentrated and tested, to show their mineral constituents.

A phial showing the bromine present in the waters, extracted by ether, and floating in it.

A phial with salts found in the Tenbury mineral water

---

51 DINNEFORD & Co., 172 *New Bond Street*—Inventors and Manufacturers.

Magnesian minerals and chemicals.

---

52 SCHILLING & SUTTON, *Brighton*—Manufacturers.

Samples of soda, Seltzer, and Fachingen water.

Effervescing lemonade.

52A STRUVE & Co., *Royal German Spa, Brighton*—Manufacturers.

Artificial mineral waters, of similar composition to the springs at Spa, Pyrmont, Marienbad, Kissingen, Seltzer, Fachingen, Püllna, and Vichy. The factitious chalybeates are said to contain the carbonate of iron in solution, whereas in those imported, a part, or the whole is precipitated.

---

53 KANE, WILLIAM JOSEPH, *Dublin*—Manufacturer.

Specimen of salt cake (sulphate of soda), made in brick furnaces, with complete condensation of the muriatic acid evolved.

Specimen of bleaching powder, made from the muriatic acid condensed.

[Bleaching powder is procured by exposing, in a stone chamber, powdered hydrate of lime, or slaked lime, to the fumes of chlorine gas, developed from a mixture of binoxide of manganese, coloride of rodium (common salt), and diluted sulphuric acid. After an exposure of certain length, the lime absorbs, and appears to combine with the chlorine, which it afterwards retains. It is, therefore, valuable for all purposes where the powerfully bleaching effects of chlorine are required, and is employed in vast quantities in the calico bleach-works, and similar establishments for the bleaching of linen and other goods.—R. E.]

Specimen of iron pyrites (bisulphuret of iron), from Messrs. Williams and Sons' Tigroney mines, county Wicklow, Ireland.

Specimen of manganese ore, containing 90 per cent. of peroxide of manganese, from Glandore mines, county Cork, Ireland.

---

54 WARD, SMITH, & Co., *Glasgow*—Manufacturers.

Iodine. Muriate of potash. Sulphate of potash. Alkali salt.

---

55 FOWLER, JOHN, 35 *Bedford Street, Covent Garden.*

Pure benzoic acid.

---

56 LAWRENCE, WILLIAM, 163 *Sloane Street*—Manufacturer.

Specimens of cod-liver oil.

---

57 BROWN, FREDERICK, 12 *Eccleston Place, Pimlico*—Patentee and Manufacturer.

Colours manufactured from the oxide of zinc, applicable for painting in distemper, on porcelain and boards, for paper staining, and for oil-cloth.

The qualities of these paints are stated to be their freedom from noxious properties, their permanency, and economy. They are not acted upon by gases. Specimen board painted with various colours in zinc paint.

---

58 ELLAM, JONES, & Co., *Markeaton Mills, Derby*—Manufacturers.

Emery—Granular rhombohedral corundum-stone, from Naxos, in Asia Minor: consisting of alumina, 86·0; silica, 3·0; oxide of iron, 4·0; and crocus (oxide of iron), for polishing fine steel and plated ware.

Mineral and vegetable colours (native and manufactured):

Mineral — sulphate of barytes, carbonate of barytes, carbonate of lime, syenite, cannel coal, mineral white, mineral black, blue-black, lapis calaminaris, dream ochre, gold ochre, mineral yellow, metallic red, umber, white rotten-stone, brown rotten-stone, bole armeniac.

Vegetable colours—Dutch pink, English pink, Brunswick green, Saxon green, Derby red.

---

59 RUSSELL & ROBERTSON, *Omoa Foundry, Holytown, Lanarkshire*—Inventors.

Specimens of white-lead paint, or ceruse, yellow chromate of lead, and red dichromate of lead; manufactured by a new process, and solely in the humid way.

The usual mode of converting blue lead into white lead, by the action of acetic acid, occupies, six weeks or two months, whereas by the new process the same end is attained in one day, without endangering the health of the workmen.

[White lead is the well-known pigment, which when ground in linseed oil is used in house painting. It is a carbonate of lead, generally containing hydrated oxide of lead, which is sometimes combined in the proportion of one atom of hydrated oxide to two of carbonate of lead. The most usual method (the Dutch) of manufacturing white lead is likewise the oldest. It consists in exposing lead to the joint action of acetic acid vapour, moist air, and carbonic acid gas. The lead is cast in the form of stars or gratings, and supported a little above the bottom of earthen pots (in shape like garden pots), into each of which a small quantity of weak acetic acid is placed. The pots are then built up in alternate layers, with spent tanner's bark, until a stack is formed; each layer of pots being covered with boards. The fermentation, which soon takes place in the tan, serves the double purpose of furnishing carbonic acid, and raising the temperature of the stack, which reaches 140° Fah. After a lapse of six or eight weeks the metallic, or blue lead, as it is called, is converted into porcelain-like masses of white lead, which are levigated in water, washed and dried. About 16,000 tons are annually made in England by this process. A very small quantity of acetic acid suffices for the conversion of a large amount of metallic into white lead; as, after it has combined with a portion of lead oxide to form neutral acetate of lead, this salt dissolves another atom of lead oxide, which is removed by the carbonic acid as carbonate of lead, and the neutral acetate set free, again to take up a fresh portion of newly-formed oxide of lead, produced by the action of the air on the metallic lead. Most of the new processes depend on similar reactions, with this difference, that oxide of lead (litharge) is employed instead of metallic lead: it is either made into a paste, with a small quantity of acetate of lead and water,

or else dissolved either in a solution of neutral acetate, or neutral nitrate of lead, and submitted to the action of carbonic acid, produced by the combustion of coke or charcoal, which precipitates the dissolved litharge, leaving the acetate or nitrate at liberty to dissolve fresh portions. Another of the new plans consisted in precipitating a neutral salt of lead (the nitrate, for example) with an alkaline carbonate.—W. D. L. R.]

60 JOHNSON, J. R., 12 *Bankside*—Inventor.

Extract of munjeet. Patterns of calico printed and dyed with the extract. Extract of madder. Patterns printed "topically" with the extract. Exhibited to illustrate a new process of extracting, economically, the colouring principle of the Rubiaceæ.

Printed calicoes, to illustrate a new process of madder dyeing, which is intended to replace garancine.

Pieces of calico printed topically with extract of madder.

[Extract of munjeet, or munjeeth, is obtained from the roots of *Rubia cordifolia*, an East Indian plant. It is imported into England from Calcutta. It is not so largely used as madder, which is furnished by the roots of another plant allied to *Rubia cordifolia*. The colour produced is said not to equal that of madder in brilliance and permanence.—R. E.]

61 SCOTT, LANGSTON, 41 *Moorgate Street*—Manufacturer.

Large vase and small glasses containing white or oxide of zinc.

Various small painted boards.

Patent white zinc is principally used for house-painting in lieu of white lead; but may be applied in the manufacture of crystals, paper-staining, card-enamelling, bleaching of lace, glazing of ware, for the down of artificial flowers, &c. It possesses great whiteness, gives a fresh tone to all colours, renders the paint or material prepared impervious to the action of gases, damp, &c., reflects artificial light, and preserves the materials. It is produced from spelter, and is principally imported in large flat slabs from Silesia, Galicia and Prussia: Russia, Belgium, and China send smaller supplies; the great European depôt is Hamburgh.

[Oxide of zinc is now largely employed instead of ceruse, and is much less noxious than that preparation of lead.—R. E.]

62 DAVY, MACKMURDO, & CO., *Bermondsey*—Manufacturers.

Samples of carbonate of ammonia; corrosive sublimate; calomel; benzoic acid; citric acid; gallic acid; oxalic acid; salt of sorrel; acetate of zinc; nitrate of silver; chloride of barium; nitrate of baryta; tartar emetic crystals; sulphite of soda; nitrate of ammonia; acetate of lead; glycerine; bisulphate of mercury; red precipitate; calomel in powder.

63 DAUPTAIN, GORTON, & CO., 17 *Wharf Road, City Road*—Manufacturers.

Four samples of ultramarine.

64 ESTCOURT, SAMUEL, 2 *Green Terrace, New River Head*—Inventor and Manufacturer.

Sample of Indian blue, for the laundry.

65 COPPOCK, JOHN, *Bridport*—Inventor.

A chemical liquid for imparting the colour of mahogany and rosewood to common woods. A specimen of the prepared wood, polished, with a bottle containing the liquid; the sides of the block are left unstained, to show the natural wood.

[The liquid commonly employed for staining wood so as to communicate to it the appearance of antiquity is a caustic solution of potash. The same effect is also produced by the use of soap leys, simply in consequence of the free alkali contained in that liquid. Other chemical fluids are likewise used for the same purpose.—R. E.]

66 BELL & CO., 2 *Wellington Street, Goswell Street.*

Mineral paints, which quickly dry under water, and on metals exposed to extreme heat. They are suitable for ships' bottoms, or for damp walls.

67 LEIFCHILD, J., *High Hill Ferry, Upper Clapton.*

Specimens of dyes for silk.—Carmine from safflower, blue from indigo, and blue from prussiate of potash.

[Safflower is yielded by a plant known botanically as *Carthamus tinctorius*, belonging to the *Asteraceæ*. The flower is alone used in dyeing. The plant is an annual, cultivated in Egypt, the Levant, &c.—R. E.]

68 MARSHALL, JOHN, *Leeds*—Manufacturer.

Nos. 1, 2, & 3. Acid and neutral extracts of indigo.

4 & 5. Carmine and liquid extract from purified indigo.

6. Refined indigo.

[Indigo is the produce of plants belonging chiefly to different species of indigo-tree; it is also obtained, to a smaller extent, from others. The state in which it exists in the juice of these plants is not well understood. It appears to be in the form of a colourless, soluble compound, and is generally obtained by fermenting the bruised plant, during which ammonia is evolved, and a yellow liquor obtained, which, on the addition of lime-water, and exposure to the air, deposits the insoluble blue substance called indigo. For the purposes of dyeing, the indigo is dissolved in sulphuric acid, with which it forms a distinct chemical compound.—E. F.]

7 & 8. Red and blue orchil paste.

9 & 10. The same, of medium quality.

11 & 12. The same, of fine quality.

13 & 14. Red orchil liquor for silk dyeing.

15 & 16. Concentrated red and blue orchil liquor.

17 & 18. Cudbear.

19 & 20. The same, of good and best quality.

21 & 22. Violet carmine, and best concentrated cudbear.

23, 24, 25, & 26. Valparaiso, Angola, Madagascar, and Cape de Verd orchella weed.

[These substances are prepared from various lichens, amongst which the *Roccella tinctoria*, *R. corallina*, *Lecanora tartarea*, *Variolaris lactea*, and *V. dealbata*, have been especially resorted to. These lichens are found on rocks on the sea-coast. The modes of treating them for the manufacture of the different dyes is the same in principle, though varying slightly in detail. They are carefully cleaned, and ground into a pulp with water, an ammoniacal liquor is from time to time added, and the mass constantly stirred, in order to expose it as much as possible to the action of the air. Peculiar substances existing in these plants are, during this process, so changed by the combined action of the atmosphere, water, and ammonia, as to generate the colouring matter, which, when perfect, is pressed out, and gypsum, chalk, or other substances are then added, so as to give it the desired consistency; they are then prepared for the market under the forms now exhibited.—E. F.]

27, 28, 29, 30, 31, 32, 33, & 34. Ground lac-dye,—X, OO, O, A (medium quality), D (medium quality), G (good quality), H (fine quality), and I (finest quality).

35. Essence of lac-dye.

[The lac-dyes are prepared by extracting the peculiar colouring matter of the "stick-lac" of commerce. This latter is a resinoid substance, the result of a secretion of several different plants—the *Ficus Indica*, *F. religiosa*,

Croton lacciferum, and others—occasioned by the punctures of a small insect (the *Coccus ficus*) made for the purpose of depositing its ova. The branches become encrusted with a reddish-coloured concretion, which consists of the inspissated juice of the plant, imbued with a peculiar colouring matter derived from the insect. The preparation of them is usually carried out in India, the remaining substances, seed-lac and shell-lac, being also articles of commerce. The colouring matter, or dye, is extensively used as a substitute for cochineal.—E. F.]

36. Ground Bengal turmeric.

[Prepared from the roots of the *Curcuma longa*. Used as a dye, and also as a condiment.—E. F.]

Specimens of 36 kinds of European and native manufacture of lac-dye in India.

---

69 LEE, CHARLES, 119 *Lower Thames Street, City*—Importer.

New black dyeing material, for dyeing silk.

---

70 DAVIES, JOHN, *Cross Street, King Street, Manchester*—Inventor and Manufacturer.

Preserved size, clear and strong, for any climate; suitable for carvers and builders, bonnet-makers, paper-hangers, and varnishers.

---

71 LAMPLOUGH, HENRY, 88 *Snow Hill*—Inventor and Proprietor.

1. Socotrine Aloes, obtained from Aloes perfoliata
2. Common Aloes, from Aloes Barbadensis.
3. Smyrna Opium, from Papaver Somniferum. Nat. Ord.—Papaveraceæ.
4. Myrrh, from Balsamodendron Myrrha. Nat. Ord.—Burseraceæ.
5. Russian Castor, from Castor Feber. Class.—Mammalia. Order.—Rodentia.
6. Aleppo Scammony, from Convolvulus Scammonia. Nat. Ord.—Convolvulaceæ.
7. Brown Annulated Ipecacuanha, from Cephaelis Ipecacuanha. Nat. Ord.—Cinchonaceæ.
8. Red Annulated Ipecacuanha.
9. Rhubarbs—English Rhubarb.
10. Dutch Trimmed Rhubarb.
11. Chinese or Indian Rhubarb.
12. Russian Rhubarb.

Residual salts from the destructive decomposition of animal substances. Specimens of chlorophospate of soda and potash; of effervescing salts; of crystals of prussiate of potash; and of sulphate of iron.

Specimen of Prussian blue.

---

72 COULSON, JUKES, & CO., 12 *Clements Lane, Lombard Street*—Proprietors.

Mineral substances used for the manufacture of paint; in their natural state, and pulverized.

---

73 PEACOCK, G., *Southampton Docks*.

Wood preserved by a chemical process.

[Those substances which prevent the decay of wood by chemical means, are generally such as combine with its nitrogenous principles, and in such a manner as to prevent or retard those principles from undergoing putrefactive change. Experience has fully proved the fact that the ordinary duration of unprepared wood exposed to causes of decomposition varies with different kinds, but that decay ultimately takes place in all. By the saturation of timber with different fluids, it is possible to avert or defer considerably these changes, and to communicate to the wood a durability far exceeding that originally possessed by it.—R. E.]

74 STEPHENS, HENRY, 54 *Lower Stamford Street, Blackfriars*—Inventor and Proprietor.

Samples of wood stained by the colour manufactured by the exhibitor, intended to show that deal or other woods may be ornamented, and the beauty of the natural graining exhibited to the best effect, thus saving the expense of painting and graining.

---

76 DUNCAN, WILLIAM L., *Sydenham, Kent*—Inventor and Producer.

Cotton waste, used for cleansing purposes by railway and steam navigation engineers, &c.

Sample, in its dirty state, after having been used for railway purposes.

Cotton waste after a cleansing process, by which it is again reclaimed to its original value and usefulness.

---

77 MASON, MRS. B., 38 *Doughty Street*.

Pooloo's Chinese cement.

---

78 HUMFREY, C., *Farnham Place, Southwark*—Inventor and Manufacturer.

Colours produced by the combination of fatty acids with metallic oxides and peroxides. Candles and refined fatty matters.

---

79 DICKSON, GEORGE, & CO., 46 *Dundas Street, Edinburgh*—Manufacturers.

Medicinal cod-liver, ling-liver, and skate-liver oils. Used in cases of pulmonary consumption, asthma, lumbago, rheumatism, glandular swellings, and all diseases of a scorbutic or strumous nature.

[Cod-liver oil has been long employed in the arts, but its use in medicine is recent. It has been given very extensively within the last two years in a variety of diseases. It appears to be principally efficacious in tuberculous affections, in the treatment of which many other remedies are often employed without success.—R. E.]

Cod-liver ointment. Ninety per cent. of the constituents of the oil is contained in this ointment.

---

80 BREAREY, WM. ARTHUR, *Douglas, Isle of Man*—Inventor.

Refined oil. Pure oleine, for watches, clocks, chronometers, fine machinery, and instruments; free from acid or mucilage; not affected by change of temperature, and having no chemical action on metals.

[For some purposes in the arts it is necessary to separate oil into its proximate constituents, *elaine*, or *oleine* and *stearine*. The former is the fluid portion, the latter the solid part which separates, at low temperatures, from the oleine. The separation is effected by cold and pressure.—R. E.]

---

81 ROBERTSON, W., *Banff, Scotland*—Manufacturer.

Cod-liver oil, manufactured by the exhibitor. Extracted by steam-heat, and rendered almost colourless, without the use of charcoal or any other decolourising agent. Manufactured at the various fishing villages along the coast of the Moray Frith.

Skate-liver oil. Manufactured by the same process. This article is more difficult to obtain. Change of temperature scarcely affects it. By some it is preferred to cod-liver oil.

Sulphate of baryta and chloride of barium.

[Chloride of barium is a crystalline compound of chlorine and barium, soluble in water. Its solution produces a white insoluble precipitate of sulphate of baryta in sulphuric acid and solutions of sulphate; hence its use as a chemical re-agent for the detection and quantitative determination of sulphuric acid in analysis.

Sulphate of baryta (permanent white), is a compound of sulphuric acid and oxide of barium; artificially prepared, it is extensively used as a pigment for water-

colouring, but has not sufficient body to be employed as an oil paint. The native sulphate of baryta is used as an adulterant of white lead paint.—W. D. L. R.]

82 LINKLATER, J., 5 *Sidney Street.*
Cod-liver oil.

83 OWEN, CHARLES, *Edinburgh*—Manufacturer.
Specimens of pure cod-liver oil.

84 KING, WILLIAM WAUDBY, *Soho Street, Liverpool*—Manufacturer.
Effervescent citrate of magnesia.

85 BURT, STEPHEN JOHN, 26 *Farringdon Street*—Proprietor.
Cantharides (*Cantharis vesicatoria*), imported from Russia.
Cantharidine, the active principle of the cantharides, alone, and in combination with alkaline and other bases. Cantharidine and potassa. Cantharidine and soda. Cantharidine and lead.

[The *Cantharis vesicatoria* of pharmacy is an insect belonging to the order *Coleoptera*, or beetles. Sicily, Spain, and Astracan are sources of our supply. In the present instance Russia has furnished the insect, and there is a large annual importation from that country. The Russian insects are larger than those of other countries. Cantharidine is obtained from an alcoholic tincture of the powdered insect, and possesses in an intense degree the blistering properties of the powdered cantharides.—R. E.]

86 HUSKISSON, J., W. & H., 77 *Swinton Street, Gray's Inn Road*—Manufacturers.
Crystals of the following chemical substances :—
1. Bicarbonate of soda.
2, 3. Rochelle salts, refined and unrefined.
4. Iodide of potassium.
5. The same, commercial.
6. Iodide of lead.
7. Biniodide of mercury.
8. Iodide purified.
9, 10. Tartaric acid and citric acid crystals.
11. Acetate of zinc.
12. Sulphate of potash crytals.
13. Purified sulphate of zinc.
14. Phosphate of soda.
15. Sulphate of iron crystals.
16. Carbonate of soda.
17, 18. Purified nitrate and bicarbonate of potash.

87 MURRAY, Sir JAMES, M.D., *Monktown, Dublin*—Inventor.
Bicarbonate of magnesia, dissolved in distilled water; free from impurities. Specimen of fluid camphor and magnesia. Carbonate of magnesia in crystals, a dentrifice.

88 STURGES, JOSEPH, *Kettering*—Inventor.
Preparation for preserving the turnip plant from the ravages of the fly.

[The turnip-plant often suffers in its earliest growth, from the attacks of a small beetle, called the *Haltica nemorum*, which devours its cotyledon leaves, and thus arrests its further growth. A fine tilth and plenty of good manure generally ensure such a vigorous growth that the plant is enabled to throw out its second pair of leaves before any serious injury has been sustained.—J. W.]

A proposed remedy for the smut in wheat, and also a preventive from the ravages of the slug, grub, and wire-worm.

89 WARD, JOHN, *County Donegal, Ramelton.*
Specimens of kelp manufactured from sea-weed.
Iodine, muriate of potash, sulphate of potash, and alkali salt; all manufactured from kelp.

90 KENT, JAMES HENRY, *Stanton, near Bury St. Edmunds*—Producer.
Dried pharmaceutical indigenous plants, in glass vessels, the lower parts of which exhibit the plants prepared for pharmaceutical purposes, and the upper portions of some of which display the botanical characters of the plants.
Powdered conium, digitalis, and other indigenous pharmaceutical plants.
Dried roots of indigenous pharmaceutical plants.
Dried immature poppyheads, and extract made from the same.
Specimens of pharmaceutical extracts, prepared from indigenous plants.

91 TRUMAN, HANBURY, & BUXTON, *Winch Lane and Spitalfields*—Producers.
Malt and hops of various qualities, exhibited in the proportions used in brewing one gallon of porter and one gallon of ale, of medium strength.

[Some conception of the quantity of hops annually produced in Great Britain, principally in Kent, Sussex, Worcester, and Hereford, may be obtained from the fact that in 1842, the duty (2*d.* per lb.), amounted to 260,978*l.* The plant belongs to the same natural family as hemp, *Cannabinaceæ*. Its botanical name is *Humulus lupulus*.
Of malt, the year 1842 produced in England and Wales, alone, nearly 31,000,000 bushels, the duty on which amounted to 4,176,742*l.*—R. E.]

92 GODFREY & COOKE, 31 *Southampton Street, Covent Garden, and* 30 *Conduit Street*—Manufacturers.
Carmine, the colouring matter of cochineal (*Coccus cacti*). Lake, from cochineal, soluble in alkalies and ammonia. Oxide of bismuth. Carbonate of ammonia, the basis of smelling salts, spirit of sal volatile, &c. Oil of amber. Salt of amber. Artificial musk, and tincture of artificial musk. Watchmakers' oil, for fine machinery. Spirit of sal volatile. Essence of ambergris. Tincture of myrrh, and sundry drugs and chemicals.

[The beautiful pigment, *Carmine*, is a result of the precipitation of an infusion of the cochineal insect (*Coccus cacti*) in water, by means of alum. The carmine of commerce is so costly an article, that it is seldom to be met with in a state of purity. Pure carmine dissolves in ammonia. It is said, by some manufacturers, that a bright and clear state of the atmosphere is necessary to the preparation of carmine of the most brilliant colour.—R. E.]

93 SQUIRE, PETER, 277 *Oxford Street*—Inventor and Manufacturer.
A variety of pharmaceutical extracts and preserved juices of medicinal plants. Liquor of taraxacum (dandelion). Solution of bimeconate of morphia. Fluid extract of Jamaica sarsaparilla. Cod-liver oil. Red rose leaves (dried without heat). Fine crystals of red ferro-prussiate of potash. Large perfect crystals of yellow ferro-prussiate of potash.

[Pharmaceutical extracts were, for a considerable period, the most fallacious of all medicinal preparations. The high temperature to which they were subjected in the manufacture destroyed the active principle sought to be concentrated. Of late they have been prepared, in some instances, by evaporation in the cold; a current of air being driven over the surface of the liquid. They are also safely obtainable by using an apparatus similar to that employed in the sugar manufacture.—R. E.]

A chloroform and ether inhaler. An apparatus for preparing infusions.

94 SMITH, T. & H., 21 *Duke Street, Edinburgh*—Inventors and Manufacturers.
Specimens of aloine, the cathartic principle of the aloes, discovered 1850; of gallic acid, in crystals; of

crystallized mannite, extracted from dandelion root; of crystallized mannite, extracted from monkshood root, discovered 1850; and of cantharidine, in crystals, the blistering principle of the Spanish fly, one part being equal to 400 parts of the powder of Spanish flies.

95 BASS, JAMES, 81 *Hatton Garden*—Inventor.

Specimens of concentrated medicinal infusions and decoctions, intended to obviate the inconveniences connected with infusions and decoctions as usually prepared.

[The infusions of medicinal substances prepared in the ordinary way are extremely liable to decomposition, and soon become covered with fungi. The concentration of such infusions in a form in which they can be preserved for some time is consequently of importance. The preparations are used medicinally by dilution with water; the infusions in their concentrated form preserving a degree of strength above that which it is advisable to adopt for medicines in their administration.—R. E.]

96 MCCULLOCH, CHARLES, *Covent Garden Market.*
English and American herbs and roots.

97 TUSTIAN, J., *Melcombe, near Banbury*—Manufacturer.

Petals of the red rose. Confection of the red rose. Extract of henbane.

98 TUSTIAN & USHER, *Melcombe, near Banbury*—Manufacturers.

English rhubarb, trimmed and untrimmed, and in powder.

[Many attempts have been made to cultivate in Europe the rhubarb plant for the sake of its medicinal roots. In France, more especially, a place called Rheumpoli has been the scene of a great experiment in this culture; and in the like manner Banbury, in Oxfordshire, has long been celebrated in the source of English supply. All these European rhubarbs have been found very inferior to that imported from Asia, the natural country of the drug.—J. L.]

99 JENNINGS, H. C., 97 *Leadenhall Street.*
Starch, gums, and vegetable wax, from potato and wheat starch.

100 HOPWOOD, HENRY, *Richmond, Surrey*—Proprietor.

Sugar of milk, crystallized in the usual manner; and crystallized at a temperature of 120° Fahrenheit, in the dark.

101 TENNANT, M. B., *Brighton.*
A chemical production for labels or artist's designs, a product of a silvery hue to be thrown over drawings of every description by means of chemical agency.

102 KEATING, THOMAS, 79 *St. Paul's Churchyard.*
Jalap root, from Asia Minor.
Hay-saffron, from Asia Minor.
Kousso, or *Brayera anthelmintica*, from Abyssinia.
Matico, or *Piper angustifolium*, from Bolivia.
Sarsaparilla root, from Paraguay.

103 WATTS, JOHN, 107 *Edgware Road*—Manufacturer.

Daphne Mezereum, bark of the root and stem. Daphne Laureola, bark of the root and stem. Cod-liver oil, made without water. Oleine of cod-liver oil. Tincture of hops, made with home-dried hops; and made with kiln-dried hops. Hydrochlorate of morphia, pure, in crystalline mass.

The following extracts are prepared in open vessels, at a temperature of from 110° to 130° Fahrenheit:—Acetic extract of colchicum, from the fresh corms. Extract of gentian, from the dried root. Pure aqueous extract of aloes, from hepatic aloes. Extract of deadly night-shade, from the flowering plant. Extract of liquorice, from the fresh root. Extract of Turkey rhubarb, from the dried root. Extract of fetid goosefoot, from the flowering plant. Extract of hemlock, from the flowering plant. Elaterium, from the fresh fruit when nearly ripe. Inspissated ox-gall. Extract of henbane, from the flowering biennial plant. Extract of white poppies, from the fresh capsules. Extract of dandelion, from the fresh roots monthly, from October to February. Powdered hemlock, the leaves of the flowering plant. Powdered foxglove, the leaves of the flowering plant.

104 DUNCAN, FLOCKHART, & Co., *Edinburgh*—Manufacturers.

Chloroform.

[The inestimable results which have attended the introduction of the anæsthetic or painless mode of operating in surgery, renders the principal medical product employed highly interesting. For this purpose it is inhaled from various forms of apparatus, and the inhalation is continued at intervals during the period of operation. Chloroform is obtained by distilling alcohol with a solution of chloride of lime. Its peculiar fruity odour has also rendered it available for the production of artificial fruit essences.—R. E.]

105 LEA, ALFRED, 150 *Oxford Street*—Inventor.
Myrrhine, a preparation for medical use.

106 MORSON, THOMAS, N. R. & SON, 19 *Southampton Row*—Manufacturers.

Specimens of crystallized salts of morphine, strichnine, cinchonie, with the pure alkaloids from which they are obtained, of pure aconita and veratric, gallic, tannic, and meconic acids, pyro-gallic and pyro-meconic acids, kreosote, &c.

[To the chemist the preparations known as alkaloids, or vegeto-alkaloids, present many features of peculiar interest. They are also of the highest medicinal importance, acting, as many of them do, with extraordinary power over the animal economy, and supplying to the physician remedies of such energetic action as to enable him, in many cases, to reduce the bulk of medicine from an inconvenient and uncertain, to a convenient form, The crystallization of the vegeto-alkaloids is peculiarly beautiful, and their chemical constitution is extremely complicated. Morphia, quina, strychnia, and brucia, are among these peculiar products, and possess intense medicinal energies.—R. E.]

107 MACFARLAN, JOHN FLETCHER, & Co., 17 *North Bridge, Edinburgh*—Manufacturers.

Series illustrative of the manufacture of the salts of morphia, embracing opium, impure muriate of morphia, pure muriate, and sulphate of morphia.

Specimens of gallic and tannic acids, embracing galls; tannic acid, impure and pure; gallic acid, impure; commercial, pure.

Specimens of sulphate of bebeerin, from green-heart bark, embracing the bark, and impure and commercial sulphate and of the alkaloid.

[Green-heart bark is yielded by the *Bebeeru* tree of Guiana. Its active principle, bebeerin, is employed in the form of sulphate, as a febrifuge tonic.—R. E.]

108 POUND, M., 198 *Oxford Street*—Importer and Manufacturer.

Imports from Calcutta:—Indian bael; fruit of the Bengal quince. Wine of bael. Bark of the root of the bael tree. Soap berries, the fruit of the Sapindus.

Jujube fruit, from the Zyziphus vulgaris of the south of Europe; imported from Paris. Flaked cold cream, &c.

109 COLLINS, ROBERT NELSON, *Oxford Court, Cannon Street*—Inventor and Producer.
Disinfecting powder, for the removal of offensive smells.

110 HATTERSLEY, W., 15 *Lisle Street, Leicester Square; and* 136 *and* 137 *St. George's East*—Inventor.
Elixir of sarsaparilla prepared without heat.

111 DEVENPORT, JOHN THISTLEWOOD, 33 *Great Russell Street, Bloomsbury.*
Iodide of iron, saccharated 50 per cent. in brilliant lamellæ, neutral and soluble, remains unaltered by the air; iodide of quinine in a neutral crystalline form; iodide of quinine and iron, in the form of syrup; iodide of iron, in the form of syrup; iodide of lead, crystals. Chloride of lead, crystals. Citrate of protoxide of iron, powder. Ammonia, citrate of protoxide of iron lamellæ. Citrate of sesquioxide of iron in lamellæ. Ammonio-citrate of sesquioxide of iron (lamellæ). Quinine, neutral sulphate, crystals, soluble. Citrate of quinine and iron, neutral soluble. Phosphate of iron, soluble lamellæ; phosphate of quinine and iron, soluble lamellæ. Benzoic acid, crystals. Caffeine, crystals. Hydrochlorate of morphia, crystals. Collodion, liquid plaster. Nitrate of silver, crystals. Fluid extract of dandelion, prepared by spontaneous inspissation of the pure juice. Solution of bimeconate of opium entirely free from narcotine. Preparations of cotyledon umbilicus.

[Collodion is a remarkable fluid prepared by dissolving gun cotton in rectified ether. It is used in surgery. Cotyledon umbilicus has lately been used as a remedy for epilepsy. Its employment has been attended in several instances with success.—R. E.]

112 NIXEY, W. G., 22 *Moor Street, Soho.*
Cement.

113 OYLER, S., 2 *York Street, High Street.*
Lint.

114 AUSTIN, JAMES B., *Banbury*—Manufacturer.
Decoctions and infusions of medical substances. Superphosphate of lime. Sulphate of lime or gypsum. Fine white sand, found at Todmarton, near Banbury.

115 BELL, J., M.P.
Cod-liver oil, stearine, sarsaparilla, juice of taraxacum, otto of roses, &c. Salt, from the Droitwich Patent Salt Works.

116 SAVORY & MOORE.
Kousso, sumbul, or musk-root.

117 THE LONDON DRUGGISTS.
Balsams, &c.: Copaiba, storax calamita, black Sonsonate, balsamito, and of Tolu.

Barks: Canella, cusparia, winter's, mezereon, cascarilla, Simaruba, Mudar, pomegranate, crown, ashy crown, loxa and jaen.

Extracts, &c.: Dragon's blood, catechu, liquorice, aloes, churrus and rhatany.

Expressed oils: Mace, cod-liver, linseed, castor, and croton.

Essential oils: Peppermint, mint, dill, anise, angelica, geranium, citronelle, cloves, cinnamon, camomile, winter green, ginger grass, cubebs, cajuputi, verbena, Indian grass, bitter almonds, lavender, sassafras, &c.

Roots: Rhubarb, orris, cassava, angelica, mezereon, calumba, heelebore, ipecacuanha, marshmallow, rhatany, smilax aspera, sarsaparilla, ginseng, salep, pariera brava, valerian, colchicum cormus, cuscus vitiver, &c.

Seeds: Cardamoms, castor-oil, croton-oil, colchicum, cumin, anise, cedron, angelica, cocculus indicus, &c.

Woods: Calumba, quassia, jalap, guaiacum, myraspermum of Sonsonate, sanders, &c.

Spices, peppers, &c.: Guinea pepper, chillies, nutmegs, mace, cassia lignea, cinnamon, cubeb pepper, cloves, almonds, calamine, camomiles, patchouli, gangah, manna, litmus, crabstones, pearls, red coral, dolichos, lactucarium, chiretta, &c.

Fruits, &c.: Colocynth, pomegranate, tamarinds, vanilla, tonka, and cassia fistula.

Gums and resins: Ammoniacum, bdellium, frankincense, galbanum, gamboge, benzoin, styraceum, larch turpentine, New Holland resin, mastic, myrrh, Arabic, olibanum, sarcocol, scammony, opoponax, sagapenum, tragacanth, tacamahae, guaiacum, &c.

Leaves, &c.: Petals of damask and cabbage roses, senna, buchu, kousso, myrospermum, &c.

Mosses: Ceylon, Corsican, Iceland, and Irish.

THE EXHIBITION OFFICIAL DESCRIPTIVE AND ILLUSTRATED CATALOGUE;

With the correct Numbers affixed. (*Now Ready.*) Super-royal 8vo., Part I., New Edition, price 10*s.*: containing Introduction, &c., and Classes I. to IV.

THE EXHIBITION OFFICIAL DESCRIPTIVE AND ILLUSTRATED CATALOGUE

Introductory Part. Price 5*s.*

THE EXHIBITION OFFICIAL DESCRIPTIVE AND ILLUSTRATED CATALOGUE

Will also be published for the use of Students and Exhibitors, in separate Sections of the Thirty Classes of the United Kingdom, and each Colony and Foreign State, at various prices, according to the extent of each, with an Alphabetical List of Exhibitors to each Class.

CONTENTS OF SEPARATE SECTIONS.

SECTION I.—RAW MATERIALS.

SECTION II.—MACHINERY.

SECTION III.—MANUFACTURES.

SECTION IV.—FINE ARTS.

LONDON: PRINTED BY W. CLOWES AND SONS, STAMFORD STREET, AND CHARING-CROSS.